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ABSTRACT

The Community College of Rhode Island (CCRI), in collaboration with the Rhode Island Department of Elementary and Secondary Education, developed a consortium which introduced tech prep to over 75% of the high schools statewide. The Tech Prep Associate Degree (TPAD) Program provides students with a concrete program of study which begins in 11th grade and concludes with the attainment of a two-year college degree. To assess the effectiveness of tech prep, quantitative and qualitative data were collected comparing tech prep and non-tech prep students. The data were collected through an examination of school records; on-site, informal interviews; and random telephone surveys. Of the 34 high schools participating in the TPAD program during 1993-94, 24 were involved in the study. The final high school student sample was composed of 1,115 11th and 12th grade tech prep students, and 235 non-tech prep students. Study findings included the following: (1) although TPAD students scored significantly lower than the comparison group prior to their participation in the program, they attained significantly higher grade point averages (GPAs) after their TPAD participation; (2) there was no significant difference between the graduation rates of the TPAD and non-TPAD students; (3) the postsecondary participation rate of TPAD students (60%) was higher than that of non-TPAD students (38.5%); (4) non-TPAD and TPAD students performed about the same in their first year of postsecondary education; and (5) 63% of high school students reported that TPAD had increased their motivation and that their grades had improved since they began their participation. (MAB)

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ASSESSING TECH PREP
A RHODE ISLAND PERSPECTIVE

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ASSESSING TECH PREP
A RHODE ISLAND PERSPECTIVE

ABSTRACT

Since its inception in 1986, the national tech prep movement has steadily grown, expanding both in size and scope. During this period of growth and development, however, there was and still is scarce evaluative data available which assesses the relationship between tech prep and its participants. The Community College of Rhode Island, in collaboration with the Rhode Island Department of Elementary and Secondary Education, developed a consortium which introduced tech prep to over 75% of the high schools statewide. Rhode Island, one of the forerunners in tech prep, conducted an evaluation of its program to determine how students are affected academically throughout their participation in the Program. Four claims of effectiveness were developed in order to compare tech prep students with non-tech prep students. Both quantitative and qualitative data was gathered to support these claims. Based on information obtained, tech prep students were found to be significantly more successful in secondary education than their non-tech prep counterparts. Although there was no significant difference between tech prep and non-tech prep high school graduation rates, tech prep students reported to be attending post-secondary institutions more frequently than their non-tech prep counterparts. At the post-secondary level, no significant difference was found between the grade point averages of tech prep and non-tech prep freshman enrolled at the Community College of Rhode Island, although several factors may have affected these results.

INTRODUCTION

The Tech Prep Associate Degree Program (TPAD) provides high school students with the education and skills needed to prepare them for a successful future - whether it be to continue their education at a post-secondary institution, enter the workforce, or join the military. It offers high school students an alternative program of study that is goal-oriented and focuses on basic academic skill development in math, science and communications. Prior to the development of the TPAD Program, many high school students were placed in general programs of study, as they were typically characterized as unfocused and unmotivated to aggressively pursue their educational studies. Hence, these students were graduating from high school prepared for neither work nor college. It is therefore the purpose of the TPAD Program, through the utilization of innovative teaching methods and goal-orientated curriculum, for students to complete the secondary portion of the program having gained the knowledge and competencies

to best prepare them to meet future challenges and opportunities.

Candidates for the TPAD Program are students who comprise the "neglected majority". These are students who exhibit the following characteristics: enrolled in unfocused general education programs; average students who fall between the 25th and 75th percentile or the middle two quartiles; underachieving in school in proportion to their abilities; generally disinterested in classwork, taking the easiest courses possible; least prepared for employment; and are most likely to enroll underprepared at a community or technical college.[1]

These students will ultimately become part of America's workforce and it is vital that they have the knowledge and skills to become competent, productive employees. As stated in a study conducted by the National Center on Education and the Economy, "America's Choice: High Skills or Low Wages!", "by the year 2000, 70% of the jobs in America will not require a four-year college degree; however, three out of four job classifications will require an education beyond high school".

The TPAD Program prepares students for entry into the ever increasing technological workforce. It provides students with a concrete program of study, which begins in grade eleven and ends with the attainment of a two-year college degree. In high school, students choose one of three career clusters which fall under the general umbrella of the TPAD Program, technical, business/office administration or allied/dental health. The curriculum focuses on cultivating written and oral communication skills and problem solving abilities. Because the tech prep classes are taught in an applied, hands-on manner, there are many activities and labs which illustrate to students that the content being studied does have real life applications.

Once students complete the secondary portion of the TPAD Program, they may continue with the next phase by furthering their education at a post-secondary institution (specifically, a community college). Here, they further refine their skills and acquire additional information to prepare them for attendance at a four year college or full-time employment.

SIGNIFICANCE of STUDY

Rhode Island is one of a select few states to conduct a formative evaluation of its tech prep program. Consequently, the findings of this study are of particular significance, lending credibility to the assertions posited by the tech prep movement.

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[1]Dale Parnell, The Neglected Majority (The Community College Press, 1985).

This evaluation provides tangible documentation that tech prep does indeed positively impact participating students.

METHODOLOGY

Sample

Of the thirty-four (34) Rhode Island high schools participating in the TPAD Program during the 1993-94 academic year, 24 were involved in this study. Selected schools were representative of the varying degrees to which the tech prep program is administered in Rhode Island. (Some schools have been involved with the Program since its inception while others are just in the beginning stages of implementation.) An individual at each high school was selected to serve as a liaison between their school and the evaluation team. Liaisons, who received a stipend, were responsible for collecting data for tech prep students and a targeted comparison group in each of their schools.

The comparison group was selected by the high schools' guidance counselors and TPAD liaisons following specific guidelines prepared by the TPAD staff. The group was composed of tech prep high school students identified by their guidance counselor as appropriate candidates for the TPAD Program, but who had declined participation, and similar students from two non-tech prep schools whose faculty were planning to implement the Program during the 1994-95 academic year.

The final high school sample was composed of 1115 eleventh and twelfth grade tech prep students (60% male, 40% female) and 235 non-tech prep students (51% male, 49% female). (Refer to Table 1 for demographic breakdown).

Table 1
Ethnicity of High School Students Sampled

Ethnicity	TPAD	Non-tech Prep	Total
White	981 (88%)	185 (79%)	1166 (86%)
Black	25 (2%)	15 (6%)	40 (3%)
Hispanic	69 (6%)	17 (7%)	86 (6%)
Asian	14 (1%)	5 (2%)	19 (1%)
Am. Indian	1 (.1%)	1 (.4%)	2 (.2%)
Unknown	25 (2%)	12 (5%)	37 (3%)
Total	1115	235	1350

The post-secondary sample targeted the entering freshman class of tech prep students at the Community College of Rhode Island. The comparison group consisted of post-secondary students exhibiting similar characteristics of tech prep students (graduated from schools offering tech prep, same rank in class, and the same academic major). Students had to complete both fall and spring semesters to be included in the study. The final sample was 71 tech prep and 180 non-tech prep students.

Qualitative Sample

The total population for the high school portion of the evaluation was all eleventh and twelfth grade tech prep students attending one of the twenty-four sampled high schools. Of this population, one hundred twenty-four (124) high school students (72% male, 28% female) were interviewed. It was determined that only 12th grade tech prep students should be interviewed. The assumption was that these students had followed the prescribed progression of courses and would consequently have had additional experience and be able to provide more feedback about the TPAD Program.

DATA COLLECTION

Liaisons at each high school were instructed to complete a data collection form for each tech prep and control group student. This form was used to obtain demographic and performance information, such as final grades in math, science, English; Metropolitan Achievement Test-Verbal (MATV) scores; graduation rates; and attendance at a post-secondary institution. A tech prep staff member collected demographic and grade point averages during the 1993-94 academic year for CCRI tech prep and non-tech prep students. Data was collected during the late spring and early summer of 1994.

Interviews were conducted on-site at the high schools throughout the month of May. At this time of the academic year students would have almost completed school and would have more input regarding the TPAD Program than at the beginning of the school year.

Arrangements to interview tech prep students were scheduled by the school liaison. Contacts were asked to select approximately five tech prep students in the 12th grade who were taking either technical, allied/dental health or business/office administration classes as part of the TPAD Program. There may have been some confusion during the selection process because not all students interviewed (only 92%) were in the 12th grade. Several factors may

have influenced this procedure, for example, at one high school, there were no tech prep students in grade twelve, only in grade eleven. These 11th grade participants, however, did take tech prep courses in the 10th grade. Another factor may be that the liaison misunderstood the criteria for participation and thought any tech prep student regardless of grade, was a candidate to be interviewed. In addition, students who were absent the day of the interview may have been substituted with students from another grade who were available.

A semi-structured interview was devised consisting of both open- and close-ended questions, providing the subject with the opportunity to answer freely while still maintaining the initial objective of the interview. Questions were asked to determine what students liked most and least about the TPAD Program; if their attitude toward school has changed since enrolling in the TPAD Program; how the applied tech prep curricula compares with regular math and science courses; their plans after high school; and how the TPAD Program has prepared them for these future endeavors. Due to time constraints in students' class schedules and because the interviews were being conducted during classtime, the average length of the interview was approximately fifteen (15) minutes.

Subjects remained anonymous in order to encourage honest responses. Students may fear the consequences if they disclosed something negative about the TPAD Program, a teacher, or their school.

In order to obtain a complete representation of students involved in the TPAD Program at both the secondary and post-secondary level, interviews were also conducted with tech prep students who attended the Community College of Rhode Island. Questions posed to these CCRI students included inquiring how tech prep has prepared them for college, what they like most and least about tech prep and their overall opinion of the TPAD Program. The population from which this sample was selected was the same as that being used for the quantitative portion of this study - the tech prep freshmen class enrolled at CCRI during the 1993-1994 academic year. The final sample for CCRI students interviewed was comprised of 27 students (74% male, 26% female).

This random survey of tech prep CCRI students was conducted during a two week period in the month of April. Because each student's class schedule varied, students may be enrolled full-time or part-time or taking day or evening classes, it was concluded that the best means to contact students was via telephone. The time of day at which these students were called varied in order to increase the chances of contacting the student. Several factors need to be taken into consideration when assessing the effectiveness of this method. For instance, each individual may not have been home at the particular time the survey was being conducted. A master list of students' telephone numbers, obtained

from CCRI's Office of Admissions and Records, was used. This list may not have been up-to-date because many telephone numbers were not listed or had been disconnected. Consequently, many students did not have the opportunity to participate in this study.

ANALYSIS of DATA

By utilizing a variety of statistical procedures, data was analyzed in order to obtain support for four claims of effectiveness. The following is an individual analysis for each of these claims.

Claim 1: Tech prep students are more successful in secondary education than non-tech prep students.

Students' scores on a standardized achievement test provided a baseline measure of academic performance prior to tech prep intervention. Administered to all tenth grade students, results of the Metropolitan Achievement Test-Verbal (MATV) were analyzed using a t-test. Results indicate that tech prep students were performing at lower levels than non-TPAD students prior to their participation in the TPAD Program. (Refer to Table 2).

The post-tech prep performance of the participant and the comparison groups was then examined using grade point averages in three subjects: math, science and communications. A total score was computed for those students having all three scores. The grade point average assigned by their teachers was used as the dependent variable. All scores were converted to NCEs (normal curve equivalents) for the analysis. A t-test of these data revealed significant differences in all three subject areas and a derived total score at the .001 level. (Refer to Table 3).

Pre- and post-test performance data indicate that, prior to participation in the Program, TPAD students scored significantly lower than the comparison group yet attained significantly higher grade point averages after participating in the TPAD Program.

Table 2
Performance of TPAD and Non-TPAD Groups
on Metropolitan Achievement Test-Verbal (MATV)

Total			TPAD			Comparison		
N	Mean	sd	N	Mean	sd	N	Mean	sd
1126	43.6	8.1	925	42.4	6.7	201	49.1	8.4

Table 3
Grade Point Average in Math, Science and Communication for TPAD Participants and Comparison Group (NCE)

	Math			Science			Communication			Total Score		
Group (N)	N	Mean	sd	N	Mean	sd	N	Mean	sd	N	Mean	sd
TPAD (N=1115)	789	84.3	4.9	768	82.6	5.7	791	82.7	6.3	486	86.3	5.2
Non-TPAD (N=235)	149	72.4	4.1	140	67.5	5.0	159	71.0	5.2	103	73.7	4.9

Summary of effects:

Math: $t = 7.78$ with $df = 936$; significant at .001
Science: $t = 8.07$ with $df = 964$; significant at .001
Communication: $t = 5.13$ with $df = 948$; significant at .001
Total: $t = 5.59$ with $df = 587$; significant at .001

Claim 2: Tech prep students have a higher high school graduation rate than non-tech prep students.

The number and percent of twelfth grade students in each group who graduated from high school was analyzed. A Chi-square analysis of available data (671 of 718 seniors) found no significant difference at the .05 level in graduation rates between the performance and comparison groups. ($x^2 = 2.7$, $df = 1$). (Refer to Table 4).

Table 4
Graduation Rates of TPAD and Comparison Groups
Observed Frequencies

Group	Graduation N (%)	Non-Graduation N (%)	Row Totals
TPAD	464 (84.5)	85 (15.5)	549
Non-TPAD	105 (86.1)	17 (13.9)	122
Column Totals	569	102	671

Claim 3: Tech prep students participate in post-secondary education more frequently than non-tech prep students.

The post-secondary participation rate for all TPAD students for whom data were available (N = 458/566) was 60.0% (275/458).

The rate for all non-TPAD students for whom data were available (N = 117/152) was 38.5% (45/117). A Chi-square analysis indicates that the differences in post-secondary participation rates between TPAD and non-TPAD students were significant at the .001 level (x^2 = 291.02, df = 1). (Refer to Table 5).

Table 5
Post-Secondary Participation Rates of TPAD and Comparison Groups
Observed Frequencies

Group	Post-Secondary N (%)	No Post-Secondary N (%)	Row Totals
TPAD	275 (60.0)	183 (40.0)	458
Non-TPAD	45 (38.5)	72 (61.5)	117
Column Totals	320	255	575

Claim 4: Tech prep students are more successful in post-secondary education than non-tech prep students.

To determine whether TPAD students performed better in their freshman year at the Community College of Rhode Island, the mean cumulative average of TPAD students was compared with that for non-tech prep students participating in the same programs of study. The total grade point average for the 1993-94 academic year was used as the dependent variable. Table 6 presents these results. A t-test of the mean cumulative averages revealed no significant difference between the TPAD participants and those in the comparison group.

Table 6
Performance of Community College Freshmen
Grade Point Average

Group	Group Size	Cumulative Average	
		Mean	sd
TPAD Students at CCRI (N=123)	71	2.16	.61
Non-TPAD Students at CCRI (N=180)	180	2.01	.52

Summary of Effects: t = 1.05 with df = 249; not significant at the .05 level.

Secondary and Post-Secondary Results of Student Interviews

Qualitative data was obtained by interviewing tech prep students at both the secondary and post-secondary level. The purpose for gathering this information was to substantiate the quantitative portion of the study as well as to provide insight into the TPAD Program from a student's perspective.

The TPAD Program was designed to have specific inherent characteristics thought to be the most conducive to addressing the needs of the "neglected majority". Applied, hands-on instruction, small classes and integrated curriculum are several features which distinguish tech prep from other educational programs. These are also the very elements which students reported not only to be what they liked best about the TPAD Program, but also what has helped them to become more motivated and interested in school.

Consequently, it was speculated that there is a positive correlation between student motivation and academic performance. The majority (63%) of high school students supported this supposition, reporting that their grades had indeed improved since participating in tech prep.

It was also speculated that a student's high school TPAD experience will positively impact the knowledge and skills essential for success at a post-secondary institution. Of the tech prep students attending the Community College of Rhode Island, 85% reported being either very prepared or somewhat prepared to enter the college as a result of their involvement with the Program. Similarly, 61% of high school students responded affirmatively when asked if participating in tech prep has prepared them for their post-secondary plans.

To facilitate the transition between high school and college, Rhode Island tech prep students have available to them a TPAD Program Coordinator. The Coordinator is available to help students with program selection, class scheduling, and provide academic advising and counseling. All students interviewed who had utilized this office (56%) were satisfied with the services provided.

DISCUSSION/INTERPRETATION

The results of this study suggest that the TPAD Program positively affects the academic performance of its participants. In grade 10, as evidenced by their scores on the MATV, tech prep students scored lower than the comparison group by a significant margin. Without the intervention of the tech prep curriculum, these students would be expected to remain behind the comparison group. However, given the tech prep intervention, these students

surpassed the comparison group as demonstrated by significantly higher grade point averages.

The claim that TPAD students are more successful in secondary education than non-TPAD students is further substantiated by the qualitative data gathered from interviews with high school tech prep students. Sixty-five percent of those surveyed reported that their grades have indeed improved since participating in the TPAD Program. One explanation of this occurrence is that the content of tech prep courses is more interesting to students. Because the material is more interesting, students become motivated to learn more. As a result, students can therefore see tangible results, good grades, as a result of studying. Another interpretation explanation is that tech prep courses are taught in an applied, hands-on manner. By capturing the student's attention through a unique, alternative presentation of material, the student then becomes interested and more receptive to learning.

The majority (61%) of these high school students also reported that the TPAD Program has influenced and/or prepared them for their post-secondary plans. This is further corroborated by the majority of interviewed CCRI tech prep students reporting they were either very prepared or somewhat prepared to enter the Community College of Rhode Island after participating in TPAD while in high school. These responses indicate that the TPAD Program is in fact providing students with a solid academic foundation which is preparing them for the continuation of their education at a post-secondary institution.

In addition, all of the CCRI tech prep students interviewed reported that they were either very satisfied or somewhat satisfied with the TPAD Program. It can be inferred that these students are confident that the knowledge and skills gained through their secondary educational experience has furnished them with necessary competencies to successfully meet the challenges at a post-secondary institution and beyond.

It was hypothesized that there would be a higher percentage of high school graduates in the TPAD group, but that was not supported by the data. One possible explanation is that schools are graduating more students in order to keep their dropout rates down but that these students are graduating without sufficient skills to get a job or to enter post-secondary education, rendering their prospects for successful employment poor. However, when tech prep students were compared to their non-tech prep counterparts regarding post-secondary participation, tech prep students' participation rates were significantly higher.

It was also hypothesized that tech prep students would fare better academically than non-tech prep students at the post-secondary level. However, no significant difference between the two groups' GPAs was found. One possible explanation may be that tech prep students did not take full advantage of the academic advising and counseling support services available to tech prep students through the office of the Tech Prep Coordinator. This

Coordinator is responsible for identifying students in academic difficulty and linking them with appropriate support services. As this segment is more fully developed, project staff will identify students earlier and link them with support services earlier, ultimately increasing their success at the Community College. One might hypothesize that had these students not participated in tech prep at the secondary level they would have fared far worse than their non-tech prep counterparts and it is, as a result of their tech prep experience that allows them to be competitive with this group. Project staff will continue to look at this phenomenon longitudinally.

CONCLUSION

In the perpetual swing of the pendulum, America's educational system has vacillated in its approaches to learning in the hope of finding a universal panacea which will ameliorate all existing problems. It seems, however, that these "cures" become extinct without ever having established their relevance. Sufficient time must be allowed for each stage of a program's development, from concept to implementation to administration, before its significance can be determined. In order to ascertain whether a particular program should be continued or, as results dictate, revised or abandoned, an evaluation must be conducted.

Tech prep is one such program caught in this quagmire. The time has come for both tech prep proponents and opponents alike to question the effectiveness and validity of the program. Is Tech Prep truly providing students with the knowledge and skills necessary to become highly functioning, productive individuals? Or is tech prep merely another crest in the wave of educational reform, destined to crash and be replaced by yet another swell of new approaches to schooling? This evaluation marks the start of Rhode Island's attempt to answer these questions. Perhaps considered a cursory examination of tech prep, this study provides evidence that the Program does indeed have a positive impact on its participants, as reflected in their academic performance and in their attendance at post-secondary institutions. These results lend credibility to the existence of tech prep. Rhode Island will continue to examine the Program, but the evidence is clear - tech prep is providing quality instruction education and obtaining quality results.